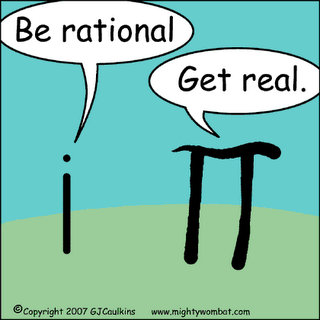
CW#62: INTRODUCTION TO IMAGINARY NUMBERS

TEACHER COPY – DO NOT WRITE ON!!!

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| **CRS** | **NCP 509:** *Exhibit knowledge of complex numbers.* |
| **Objective** | **SWBAT** *simplify expressions with imaginary numbers.* |

*In our quadratics unit, we said that is an equation with no “REAL” solution.*

* *An imaginary number is a number that does not belong to the “real” number set (it is either a complex or imaginary number).*
* *Imaginary numbers have the form bi where b is a non-zero real number and i is the imaginary number such that:*

* *It is an imaginary number because the square of a real number will never equal a negative!*
* *When squaring both sides, we can conclude that:*

*(i)2 = …. i2 = -1*

* *When simplifying negative radicands,*
* *Example: = 3i*

***Step 1:*** *Use the multiplication property of radicals to isolate i (remember, )*

***Step 2:*** *Re-write answer multiplying any real numbers with i.*

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| ***Example 1:*** Simplify: – 4 | ***Example 2****:* Simplify: | ***Example 3***: Simplify: 3 |
| 1) Simplify:  A. -121*i*  B. -11*i*  C. -11  D. 11*i*  E. 121*i* | 2) is equivalent to:  a) 144i  b) 12  c) 12i  d) -12  e) -12i | 3) Simplify: |
| 4)– 8 is equivalent to:  a)  b)  c)  d) | 5) is equivalent to:  a)  b)  c)  d) | 6) is equivalent to:  a) 256i  b) 16  c) -16i  d) 16i |
| ***COMPLEX NUMBERS:***  ***Remember, and . Thus,***  ***Step 1:*** *Combine like terms!*  ***Step 2:*** *Substitute -1 for all i² terms.*  ***Step 3:*** *Simplify!* | | |
| ***Example 4:*** | 7) Simplify: 2*i* + 3*i* + 15 + 2i² | 8) Simplify: |
| 9) Simplify: -8i – 3i² + 8 – 2i² | 10) Simplify: 16 – 4i² + 3 | 11) Simplify: -8 + i - i² + i |
|  | | |
| ***Example 5:***Simplify: (3i)(-4i)(-i) = | ***Example 6*:** | 12) Simplify: |
| 13) Simplify: | 14) Simplify: | 15) Simplify: |
| ***Example 7****:* Simplify: (3 + 2i)(4 – 5i) | 16) Simplify: (-6i + 2)(-4i – 8) | 17) Simplify: (-4 + 7i)(4i – 10) |
| 18) Simplify: 8*i* (-2*i* – 6) | 19) Simplify: -8i – 4(i + 3i²) | 20) Simplify: (4 -2i) (3+ 5i) |
| 21) Which real number is equivalent to ?  A.-1  B.  C. 1  D. 4  E. There is no equivalent real number | 22) Simplify: (2 – 3i) (2+ 3i) | 23) Which real number is equivalent to ?  A.-1  B.  C. 1  D. 9  E. There is no equivalent real number |
| **ACT STYLE!!!** | | |
| 26) Which of the following is the least common denominator for the expression below?  f)  g)  h)  j)  k) | 27) For all , ?  a) b) c)  d) e) | 28) If , what is in terms of and ?  f)  g)  h)  j)  k) |

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